

**ATTACHMENT #6A
SUBPART CC COMPLIANCE PLAN**

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ATTACHMENT #6A SUBPART CC COMPLIANCE

6A.1 PURPOSE

The purpose of this plan is to document the procedures that will be implemented at the CAMDS facility for compliance with the requirements of R315-8-22, which incorporate by reference [40 CFR 264, Subpart CC standards - Air Emission Standards for Tanks, Surface Impoundments, and Containers].

6A.2 SCOPE

Applicability (§264.1080): The Subpart CC requirements apply to treatment, storage, or disposal of hazardous wastes in units regulated under 264, subparts I, J, and K (containers, tank systems, and surface impoundments used for management of hazardous waste), including <90 day storage areas.

The subpart CC standards, which are covered in this plan, apply to all tanks and containers that are in use at the CAMDS facility for the management of hazardous wastes that have a volatile organic (VO) concentration greater than 500 ppmw. Hazardous wastes are prohibited from discharge to surface impoundments, regulated under 264 subpart K, at the CAMDS facility, therefore these requirements are not applicable and are omitted from this plan. Parts of the Subpart AA regulations (Air Emission Standards for Process Vents) are incorporated in this document under the standards for Closed-vent Systems and Control Devices (§264.1087), which are referenced in the Subpart CC regulations. These requirements apply to the ventilation / carbon bed filter systems in place at CAMDS.

6A.3 INTRODUCTION

Federal regulations applicable to hazardous waste TSDFs that address the problems of fugitive emissions of VOCs are included in R315-8-22[40 CFR 264, Subparts AA, BB, and CC]. Subpart CC adds control requirements for RCRA units to reduce organic emissions from hazardous waste managed in tanks and containers. The applicability of subpart CC is based on the volatile organic content (criteria, > 500 ppm volatile organic content by weight) of the hazardous waste being managed or processed in these units.

Tanks that are regulated under Subpart CC tank level 1 or level 2 controls (§264.1084(c), §264.1084(d) are required to have a cover, which may vent through a closed vent system to a control device. Alternate controls are allowed for different types of tanks such as external floating roof, fixed roof with internal floating roof, and pressure tanks. The agent tanks, toxic maintenance facility (TMF) tanks, and other HW tanks at CAMDS having a VOC content > 500 ppmw are subject to the subpart CC requirements.

Sumps that are hazardous waste collection units provide secondary containment for other hazardous waste management units. Waste liquids in these sumps are collected and transferred to permitted storage tanks within 24 hours. Containers having a volume of less than 26 gallons are exempt from subpart CC. The requirements for non-exempt containers vary depending on the container design capacity and the volatile component content. In general, containers must remain covered except during operations such as sampling that require them to be open.

6A.4 GENERAL REQUIREMENTS

6A.4.1 Exemptions from subpart CC (§264.1082(c)(1))

Any tank, surface impoundment, or container for which all hazardous waste (HW) that enters the unit has an average volatile organic (VO) concentration (over an averaging period) at the point of origination of less than 500 parts per million by weight (ppmw) is exempt from the Subpart CC standards. Subpart CC requires the use of the waste determination procedures of §265.1084 (a)(2) through (a) (4) for determining the average VO concentration for hazardous wastes managed in tanks and containers exempt from Subpart CC controls by virtue of low VO content. This includes direct measurement or knowledge of the waste as specified in the waste determination procedure. Waste determinations that apply to CAMDS are maintained in the operating record. These waste determinations shall be updated at least once every 12 months following the initial determination (§265.1084(a)(3)(ii)(A)), or more frequently if the generation process changes in such a way as to increase the volatile organic content.

Containers having a capacity of 26 gallons or less are exempt from Subpart CC container controls.

Other Subpart CC exemptions involving treatment of HW to reduce the organic content by 95% are allowed by the Subpart CC standards (§264.1082(c)(2)). The intent of these exemptions is to provide the option of reducing the VOC concentration as an alternative to managing waste in accordance with CC controls. Such waste treatments are not practiced at CAMDS, therefore these exemptions do not apply.

6A.4.2 Waste Determination Procedures

6A.4.2.1 Waste Determination for Average VOC concentration at the point of waste origination.

Waste determination procedures are only required for waste streams managed in units (tanks and containers) which are considered exempt from subpart CC air emission control requirements (because of low VO content), and are not maintained under Subpart CC controls.

In general, hazardous wastes stored in containers and tanks at CAMDS are managed in accordance with Subpart CC controls. Therefore routine waste determinations for VOC content are not generally required.

Acceptable methods must be based on direct measurement (sampling and analysis) or knowledge of the waste. As specified in 40 CFR 265.1084(a)(4), knowledge of the waste can be based on material balance calculations, constituent-specific chemical test data. Previous test data for other locations managing the same type of waste stream, or other knowledge based on information included in manifests, shipping papers, or waste certification notices. The specific methods for sampling and analysis for wastes for the determination of applicability of Subpart CC controls are specified in the Waste Analysis Plan, Attachment 2, and Attachment 6, Appendix 2, **Subpart CC Sampling and Analysis Plan** of the RCRA part B permit.

If any of the waste determination procedures indicate that the waste has an average VO concentration of 500 ppmw or greater, then subpart CC air emission controls are required.

Documentation of waste determinations will be maintained in the facility operating record.

6A.4.2.2 Waste Determination Procedures for Determination of Maximum Organic Vapor Pressure.

For HW placed in tanks under tank level 1 controls, the maximum organic vapor pressure must be determined to ensure the HW meets the tank level 1 criteria as shown in Table 1 below.

Table 1. Maximum Organic Vapor Pressures Allowed for Tank Level 1 Controls	
Tank Design Capacity (Gallons)	Maximum Organic Vapor Pressure (psi)
40,000	< 0.75
20,000 but < 40,000	< 4.0
< 20,000	< 11.11

The waste streams to be stored in tanks at CAMDS are chemical agents and agent surrogates, PAS brines, spent decontamination solutions (SDS), and miscellaneous waste liquids. Vapor pressure data are known for the chemical agents placed in agent storage tanks.

PAS Brines

The Pollution Abatement System (PAS) brines do not come into contact with significant amounts of organics since the gases processed in the pollution abatement system are subjected to high temperatures and adequate residence times for good combustion in the incineration system. Samples of PAS brine sampled to date have not shown detectable levels of VOCs.

The composition of PAS brine is well known. Therefore the maximum organic vapor pressure will be determined by knowledge of the waste. The VOC content of the PAS brine is also tested annually as required by the Waste Analysis Plan, Attachment #2 of the RCRA permit.

Spent Decontamination Solutions

The processes that generate spent decontamination solutions (SDS) are more variable than the generation of PAS brines. All SDS brines are tested to ensure that no agent levels (in excess of 20 ppb for GA, GB, VX, 200 ppb for H/HD/HT, and for L) are detected before the SDS brines are transferred to the brine dryer area. The VOC content of the SDS brine is also tested annually as required by the Waste Analysis Plan, Attachment #2 of the RCRA permit. The maximum organic vapor pressure for SDS brines will be determined by knowledge, unless process changes occur that could cause the organic vapor pressure to increase.

Miscellaneous Liquid Wastes

The Maximum organic vapor pressure of miscellaneous liquid wastes (waste hydraulic fluid, laboratory wastes, etc.) will be determined prior to being placed in the TMF tanks.

Maximum organic vapor pressure determinations will be conducted using direct measurement as specified by §265.1084(c)(3)(i)-(ii), or by using generator knowledge derived from published data or other direct measurements as allowed by §265.1084(c)(4).

6A.4.2.3 Waste Determination Procedure for Determination of “No Detectable Organic Emissions”

For tanks under Subpart CC tank level 2 controls for a “tank connected with a closed-vent system to a control device,” if the head space above the liquid is at or above atmospheric pressure, any

closure devices on the tank roof must be designed and operated with no detectable organic emissions (ie. having no readings greater than or equal to 500 ppmv above background). The procedure for determining “no detectable organic emissions” must comply with §265.1084(d), which is monitoring with an organic vapor detecting instrument in accordance with EPA Method 21 and following an approved sampling plan, Appendix 2 Air Emission Sampling Plans.

For closed vent systems in which the vent gases are at or above atmospheric pressure, all seams, gaskets, connection points, inspection openings, etc. must be designed and operated with no detectable organic emissions. Determinations of no detectable organic emissions are made by monitoring all interfaces, flanges, dampers, etc. in accordance with EPA Method 21, at least annually, or sooner if there are indications of organic emissions to the atmosphere in the closed vent systems.

6A.5 REQUIREMENTS FOR TANKS AND PRIMARY CONTAINMENT SUMPS

Tanks and containment sumps are defined by R315-1 as stationary devices designed to contain an accumulation of HW and which is constructed primarily of non-earthen materials that provides structural support. The tanks at CAMDS, which are subject to the subpart CC rules, include seven agent tanks (1-7), two TMF tanks, and five Brine Dryer Area (BDA) tanks.

Tanks subject to air emission controls under Subpart CC must use either Level 1 or Level 2 controls (these definitions are explained below). Operational, inspection, monitoring, and record keeping requirements of Subpart CC must also be followed. Inspection and monitoring requirements are outlined in Attachments 5 and 18. All sumps at CAMDS are only used for secondary containment, and are emptied at least once per 24-hour day. There are no sumps used for primary containment. Any sumps at CAMDS, which receive hazardous wastes and serve as primary containment, are subject to the Subpart CC requirements. Sumps which only receive hazardous waste during an upset or emergency condition, or which serve as secondary containment are not subject the Subpart CC requirements.

6A.5.1 Level 1 Controls for Tanks

Level 1 Controls may be used by any tank meeting all of the following requirements:

- a) The tank is not used for waste stabilization.
- b) Maximum organic vapor pressure of the waste does not exceed the allowable vapor pressure for the tank design capacity as given above in Table 1.
- c) Tank heating temperatures must not exceed the temperature at which the maximum allowable organic vapor pressure of waste was determined.

If the wastes managed in the tank do not meet all of these requirements, then tank Level 2 controls apply.

The maximum organic vapor pressure of waste in tanks is determined by one of the following methods (§265.1084(c)(3)(ii)):

- EPA Method 25E, part 60, Appendix A
- API Publication 2517
- Methods from standard reference texts
- ASTM method 2879 - 92

Other methods approved by the regional administrator

and/or knowledge of the waste as allowed in §265.1084(c)(4) performed prior to waste being placed in the tank. Determinations of maximum organic vapor pressure will be performed at least annually, and at any time the process changes such a manner that increased levels of volatile organics are expected.

Tank Level 1 Controls: two options:

- 1) As specified by §264.1084(c)(2), applies to a tank with a fixed roof designed with no visible cracks, gaps, or other open spaces in roof seams and mountings. However, fixed roofs may be designed with openings that are equipped with a closure device with no visible cracks, gaps, or other open spaces when secured in a closed position. In addition, fixed roofs may be designed with openings for pressure relief devices or conservation vents vented directly to the atmosphere.
- 2) Alternately, as allowed in 264.1084(c)(2)(B), the tanks may be connected by a closed vent system to a control device that destroys or removes organics from the vent stream.

Tanks must be constructed of suitable materials (structurally suitable, impermeable to VOC vapors, etc.). Any openings, including pressure-vacuum relief devices must be designed and operated with no detectable organic emissions.

The surrogates, agents and agent related materials contained in agent storage tanks are well characterized and are within the requirements for volumes and pressures (at various temperatures) specified in Table 1. Therefore, the Level 1 controls are the method of compliance for storing agent in agent storage tanks at CAMDS. The documents specifying the liquid vapor pressure data are maintained in the CAMDS operating record.

Agent related materials, including surrogate materials, spent decon, and PAS brines will be characterized by either direct measurement or by user knowledge before being placed in tanks subject to Subpart CC controls. User knowledge will be based on determinations by direct measurement from previous or other similar processes, as allowed in 265.1084(c)(4).

EPA Region 8 has determined that the CAMDS agent storage tanks meet the tank level 1 controls provided that the rooms in which they reside are considered a “direct conveyance” of the closed vent system to a control device (ie. the site ventilation / carbon bed filter system), and the rooms meet the Criteria for a Permanent or Temporary Total Enclosure. This requirement is verified by the initial and annual calculations using the Procedure T method.

6A.5.2 Level 2 Controls for Tanks

Level 2 controls must be applied to all tanks used for waste stabilization or tanks that do not fully meet the Level 1 requirements (264.1084(b)(2)). CAMDS may also choose to comply with Tank Level 2 controls, even if the Tank Level 1 requirements are met. Subpart CC provides five alternatives for tanks subject to Tank Level 2 control requirements (264.1084(d)):

- 1) Fixed roof with internal floating roof: designed and operated to meet specified subpart CC requirements 264.1084 (d)(e)(1) through (e)(3).

- 2) External floating roof: designed and operated to meet subpart CC requirements of 264.1084 (f).
- 3) Tank vented through a closed-vent system to a control device: in accordance with the requirements of 264.1084 (g): If the system is operating under negative pressure, the cover must be designed with no visible cracks, holes, or gaps, or other open spaces in cover seams, foundation mountings, and cover closure devices when secured in a closed position. If the tank is not operating under negative pressure, then the cover must be designed to operate with no detectable organic emissions when all cover closure devices are secured in a closed, sealed position, and monitored initially and annually thereafter (test using EPA Method 21).
- 4) Pressure tank: operated as a closed system during normal operation and designed not to vent due to headspace compression during filling the tank to its capacity. Tank fittings must be designed to operate with no detectable organic emissions (tested using Method 21).

Tank inside an enclosure: Must be vented to a *combustion* control device. The enclosure must be designed and operated in accordance with the criteria for a permanent total enclosure as specified in 40 CFR 52,741, Appendix B, Procedure-T Criteria for and Verification of a Permanent or Temporary Total Enclosure. EPA has defined a permanent total enclosure as a permanently installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge through a control device.

6A.6 CONTROLS FOR CAMDS TANKS AND PRIMARY CONTAINMENT SUMPS

6A.6.1 Agent Storage Tanks: These tanks, ranging from 250 to 450 gallons (0.946 - 1.703 m³) are located in the ECC Segregator, MDM, and LIC buildings. Detailed information on the agent tanks can be found in Module IV and Attachment 13 of the RCRA part B permit.

CAMDS Agent Storage Tanks			
Tank No.	Permitted Capacity	Location	Material Stored
SEG-T1	250 gallons	ECC Segregator Building	Agent
SEG-T2	250 gallons	ECC Segregator Building	Agent
MDF-T3	250 gallons	Munition Demil Facility	Agent
MDF-T4	250 gallons	Munition Demil Facility	Agent
LIC-T5	250 gallons	LIC Building	Agent
ASR-T6	250 gallons	Agent Storage Room	Agent
ASR-T7	450 gallons	Agent Storage Room	Agent

These tanks only store chemical agents, agent surrogates, and agent decontamination residues. The agent having the highest vapor pressure is GA. Agent GA may contain up to 50% monochloro benzene (MCB), which is more volatile than GA. Pure MCB has a vapor pressure of 0.77 psi at 121.5 deg.°F. Since subpart CC allows tank level 1 controls for a tank less than 19,813 gallons containing a waste with a maximum organic vapor pressure of 11.11 psi, the agent storage tanks at CAMDS meet the requirements for tank level 1 controls.

Each of these tanks are closed vessels and have a vent pipe in the head space leading to a small carbon canister which vents into the room in which the tanks are located. The small carbon

canisters for each tank are not considered a control device and no VOC capture is assumed. The rooms which house the tanks are maintained under a negative pressure and ventilated by a closed vent system to a carbon filter control device (the site ventilation carbon bed filter system). When the LIC is running, the tank headspace is vented by the combustion air fan. Therefore, the LIC is the control device for the agent tank (Tank T5) in the LIC building when the LIC is running. Since the rooms directly convey any VOC emissions to the closed vent system they are considered part of the closed vent system, and the design and operating requirements for a permanent total enclosure as specified in Procedure T - Criteria for Verification of Permanent or Temporary Total Enclosure, 40 CFR part 52.741, Appendix B, apply.

As described above, the agent storage tanks comply with tank level 1 controls as a tank vented through a closed vent system to a control device.

6A.6.2 Toxic Maintenance Facility Tanks:

CAMDS TMF Tanks			
Tank No.	Permitted Capacity	Location	Material Stored / Treated
TMF-1	1,440 gallons	Toxic Maintenance	SDS, Miscellaneous Waste
		Facility Building	Liquids from spills, and liquid laboratory wastes
TMF-2	1,440 gallons	Toxic Maintenance	SDS, Miscellaneous Waste
		Facility Building	Liquids from spills, and liquid laboratory wastes

Tanks TMF-1 and TMF-2 are permitted to store up to 1,440 gallons each of spent decontamination solutions, miscellaneous liquids (liquid chemical agent sludges, contaminated spent hydraulic fluid, contaminated spent lubricating oil, liquid laboratory wastes), and solutions for decontaminating equipment and toxic operations areas (sodium hydroxide or hypochlorite solutions). These tanks and their contents are managed under Subpart CC level 1 controls. Because the materials managed in the TMF tanks are subject to Subpart CC controls, Subpart CC procedures for determination of maximum vapor pressure of a hazardous waste in a tank, and Verification of Permanent or Temporary Total enclosure are required. For storing any hazardous waste in the TMF tanks, the organic vapor pressure at the highest expected temperature will be less than 11.11 psi (76.6 kPa).

6A.6.3 Brine Dryer Area Tanks

The Brine Dryer Area tanks are used for storing and treating spent Pollution Abatement System (PAS) brines as well as Spent Decontamination Solutions (SDS).

CAMDS Brine Dryer Area Tanks			
Tank No.	Permitted Capacity	Location	Material Stored / Treated
T13-A	4,500 gallons	BDA Building	Spent PAS Brines
T13-B	4,500 gallons	BDA Building	Spent PAS Brines
T13-C	4,500 gallons	BDA Building	Spent PAS Brines
T13-D	13,500 gallons	BDA Building	Spent PAS brine or SDS
T13-E	13,500 gallons	BDA Building	Spent PAS brine or SDS

These liquids are tested at the point of origination for agent content and will be treated, if necessary, to obtain agent levels below the following levels: 20 ppb for agents GB and VX, and 200 ppb for mustard (H/HT/HD) prior to being placed in the BDA tanks. The liquids are also tested for volatile organics, at least annually and sooner if changes in the processes generating these liquids are such that increased the VOC levels are expected. It is not expected that liquids containing volatile organics greater than 500 ppmw will be placed in the BDA tanks.

The BDA tanks and their contents are managed in accordance with Tank Level 1 controls of Subpart CC. The BDA tanks comply with the Level 1 control option specified by 264.1084(c)(2) which is a tank with a fixed roof designed with no visible cracks, gaps, or other open spaces in roof seams and mountings. The tank roofs are fitted with conservation vents that vent through a carbon filter to the atmosphere. The carbon filters are not considered VOC control devices.

Samples of the tank liquids will be analyzed for agent concentration, corrosivity, specific gravity, volatile organics (Method 8260), and screened for total organics. Details for specific analytical methods are given in the CAMDS Waste Analysis Plan, Attachment 2.

PAS brines are also sampled annually, if generated, as described above. Other liquid wastes (hydraulic fluids, liquid laboratory wastes, etc.) will be analyzed annually, or more frequently if the processes generating such wastes are changed in such a manner that could cause the volatile organic content to increase.

6A.6.4 Tank Operational Requirements

All vents, man ways, blind flanges, conservation vents, and other devices will remain in the closed position except when needed to avoid hazardous conditions, prevent physical damage, or for scheduled calibrations, maintenance, and inspections.

The transfer of HW between the tanks subject to the Subpart CC standards will be conducted using hard piping or another system that does not allow exposure of the waste to the atmosphere. Pumping to open containers will be done using submerged fill methods to minimize volatilization of organics. All containers, piping, etc. will be inspected prior to transfers to wear, defects, etc. that could result in liquid or vapor releases.

6A.7 REQUIREMENTS FOR CONTAINERS (264.1086)

A container, as it applies to Subpart CC, is defined as any portable device, in which material is stored, transported, treated, disposed of, or otherwise handled. Hazardous waste containers (having average VOC concentration greater than 500 ppmw) greater than 26 gallons in capacity

are subject to the air emission control requirements under Subpart CC, and must use either Level 1, Level 2, or Level 3 (defined below) controls. These containers must also follow operational, inspection, monitoring, and record keeping requirements.

Typical containers in use at CAMDS include: drums, ton containers, and other DOT approved containers. With the exception of the single pallet only rocket transporter (SPORT) described below, all containers used to store hazardous waste at CAMDS are DOT approved containers. Detailed descriptions of containers used to manage HW are given in Attachment 12 of the part B RCRA permit.

Single pallet-only rocket transporters, SPORTs, are steel boxes with a gasketed lid. SPORTs are used as secondary containment for containers with free liquids, and are used as containers for HW without free liquids. SPORTs used for storage of HW without free liquids are not in "light liquid service" and therefore could comply with container level 1 control as a container with cover, and continuous barrier over the surface of the waste. Free liquids will not be stored in SPORTs.

The three levels of controls for containers are described below.

6A.7.1 Level 1 controls for containers: 264.1086(c)

May be applied to all containers (any size or capacity) that are not used for waste stabilization. An exception applies to containers that are greater than 119 gallons, and are in light material service, this type of container would require Level 2 controls. Any container used for waste stabilization must use Level 3 controls (note: waste stabilization is not practiced at CAMDS).

Light material service is present in a liquid waste when at least 20 percent of the waste, by weight, consists of pure organic constituents having a vapor pressure greater than 0.3 KiloPascals (0.04 psi) at 20 degrees Celsius (68 degrees Fahrenheit).

Three alternatives may be used for containers to meet Level 1 control requirements:

- a) The use of a container meeting applicable U.S. DOT requirements under 49 CFR parts 172, 173, 178, 179, and 180.
- b) Any container with a cover designed with no visible cracks, holes, gaps or other open spaces. Cover openings need to be equipped with a closure device such that there are no visible cracks, holes or gaps, or other open spaces when secured in a closed position. A visual inspection is required when the cover is applied and annually thereafter, and any time the container is re-opened.

An organic vapor suppressing barrier on or over the hazardous waste in the container so that no HW is exposed to the atmosphere. This includes suitable foam on the waste or a tarp over the container.

No special requirements will be carried out for loading HW into containers using Level 1 controls.

Except for ton containers (TCs) and SPORTs, all containers used to store HW at CAMDS are less than 121 gallons.

6A.7.2 Level 2 controls for containers; 264.1086(d)

These controls may be used with any container of any size, except for containers used for waste stabilization, which must use Level 3 controls.

Three alternatives are available for containers to meet Level 2 control requirements:

- a) The use of a container meeting applicable U.S. DOT requirements under 49 CFR parts 172, 173, 178, 179, and 180.
- b) Any container that operates with no detectable organic emissions as determined through monitoring using EPA Method 21.
- c) A container that has been demonstrated to be vapor leak tight within the preceding 12 months using EPA Method 27, which is a pressurization test that measures pressure change over a 5 minute interval. This alternative is commonly applied to tanker containers, and could be used with ton containers.

Wastes from a container under Level 2 controls will be transferred in or out of the container in such a manner as to minimize exposure of the waste to the atmosphere (to the extent practicable considering the physical properties of the waste and good engineering and safety practices for handling flammable or ignitable hazardous materials). Typical examples of loading procedures that may be used include submerged fill methods; vapor balancing or vapor recovery systems, and purging transfer lines before disconnecting from the top of the container.

CAMDS may store ton containers (> 121 gallons) of agent GA prior to treatment. GA agent containing up to 50% monochlorobenzene would be considered in light liquid service and subject to container level 2 controls. Ton containers are DOT approved, meeting the requirements listed above in paragraph 6.7.2(a), above.

6A.7.3 Level 3 Controls for Containers

All containers used for waste stabilization shall comply with level 3 controls. The two alternatives provided by Subpart CC are as follows:

- a) Place the open container inside an enclosure vented directly to a control device. The control device will be designed and operated in accordance with the criteria for a total enclosure as described in procedure T. The enclosure may have permanent or temporary openings for worker access and for passage of containers through the enclosure by conveyors or by other means.
- b) Vent the container directly to a control device (i.e. carbon canister, fume incinerator, etc.)

Waste stabilization is not practiced at CAMDS. Therefore, CAMDS containers are not required to comply with container level 3 controls.

6A.7.4 Container Operational Requirements

Safety devices venting directly to atmosphere (pressure relief valves, conservation vents, etc.) shall remain in a closed position except when needed to remain open to prevent physical damage

to the container or the control equipment, or to avoid an unsafe condition, in the event of an emergency or unplanned event Closure devices (man ways, flanges, inspection doors, etc.) must be maintained in the closed position except when accessing waste or equipment within the container. If the container is empty (as defined in 40 CFR 261.7(b)), it may remain open to the atmosphere without a closure device in the closed position. Containers subject to Subpart CC are not subject to transfer requirements among other containers.

Since all containerized hazardous wastes are stored in containers that are considered DOT approved packaging, or otherwise managed in accordance with Subpart CC controls, no waste determinations are done for containerized hazardous waste at CAMDS.

The Subpart CC applicability, control methods, and waste determination requirements are summarized below in Table 2.0.

6A.8 CLOSED VENT SYSTEMS AND CONTROL DEVICE REQUIREMENTS

The closed vent system at CAMDS complies with the requirements of 264.1087.

The closed vent system (and carbon filter control device) at CAMDS is described in Attachment 18, Module II, and Attachment 1, page 13 -14 of the RCRA part B permit. This system consists of manifolds, ducts, dampers, controls, and carbon absorption (filter) units. All of the agent storage tanks, and TMF tanks, are ventilated by the CAMDS Site Ventilation and Filter System. All sections of the vent duct work (except the outlet from the guard bed filter to the MDF building), including the filter housings are operated at a negative pressure relative to atmospheric pressure. There are no bypasses around the carbon filters.

All spent carbon from the site filter system is managed as HW as required by 40 CFR 264.1033(n). It is currently stored in containers pending approval for final disposal.

Table 2. Subpart CC Control and Waste Determination Requirements				
Waste Units	Subpart CC Applicable?	Avg. VOC < 500 ppmw Determination Method**	Max. Organic Vapor Pressure Determination Method**	Subpart CC Control Method
Agent Storage Tanks	Yes	Not Applicable	User Knowledge or Direct Measurement	Tank Level 1*
PAS Brine Storage Tanks	No (< 500 ppmw VOC)	User Knowledge based on Direct Measurement	Not Applicable	Not Applicable
TMF Tanks with Spent Decon and Miscellaneous Liquids	Yes	Not Applicable	User Knowledge Direct Measurement	Tank Level 1*
Waste Brine in Brine Dryer Area Tanks.	Assumed Applicable	Not Applicable	User Knowledge or Direct Measurement	Tank Level 1*
Waste in Containers	Assumed Applicable	Not Applicable	Not Applicable	Container Level 1 or Level 2 Controls (DOT Approved)
*Per HSWA permit, Final HSWA Subpart CC Permit Decision for CAMDS, EPA Region 8, Table 1. Agent Storage Room Agent Tanks.				
** Waste determination requirements using user knowledge are based on compliance with R315-8-22				

6A.8.1 Control Device Performance Requirements:

Subpart CC requires that control devices (which at CAMDS is the carbon filter farm) must be designed and operated with an organic recovery or reduction efficiency of at least 95 percent by weight as required by 264.1033(k). The carbon filter system is designed and operated to achieve (or exceed) these requirements. As shown in Appendix B, the minimum acceptable performance of carbon filters for Chemical Stockpile Disposal Program (CSDP) requirements is a knock down ratio of 10,000 to 1, or 99.99% removal. Tests at CAMDS and other Army installations, using actual measurements have calculated actual removal efficiencies of 350,000 to 1 (99.999997% removal), with agent GB. Therefore, the CAMDS carbon filter farm exceeds the reduction efficiency required for a Subpart CC control device.

6A.8.2 Operation and Maintenance of Control Devices

The carbon filters used at CAMDS are not regenerated. The control devices (the carbon filter farm) are operated, maintained, and inspected in accordance with our RCRA operating permit. This equipment is inspected at least daily, and corrective actions are taken promptly. Attachment 18 of the RCRA permit details the carbon filter system operation and maintenance, and the requirements for carbon change out. As required by 264.1033(h), the carbon beds are checked for breakthrough on a regular basis, and the carbon is replaced immediately with fresh carbon whenever breakthrough is detected. System inspection requirements are contained in Attachment 5 of the RCRA Part B Permit.

Typical items for inspection include: check for pressure drop across filters, check for air flow in ducts, check that agent monitors are present and operational, inspect dampers and control equipment for corrosion and wear.

Control device performance requirements do not apply during periods of system malfunction. Any malfunctions shall be corrected as soon as practicable.

Periods of planned routine maintenance of the carbon filter system (when the entire system is shut down) must not exceed 240 hours per year.

6A.8.3 Requirements for closed vent systems

The closed vent system consists of manifolds, ducts, pipes, valves, flanges and other connectors, and blowers that transport vapors and gases from the equipment of HW management units to the carbon filter system control device.

At CAMDS this includes filter system vent ductwork, dampers, and controls.

Closed vent systems shall be operated in accordance with Subpart AA (264.1033), with no detectable emissions as determined by no readings of greater than 500 ppm above background levels, measured in accordance with EPA Method 21. Subpart AA does not require monitoring for no detectable emissions for systems under negative pressure (264.1033(k)(2)). Thus, except for the discharge from the guard bed filter, the CAMDS filter system does not require monitoring for no detectable emissions. The discharge duct of the guard bed filter will be monitored annually for compliance with no detectable emissions requirements, by monitoring in accordance with EPA Method 21.

6A.9 MONITORING REQUIREMENTS

Under Subpart CC, it may be necessary to perform monitoring of tank headspaces or containers under some of the control options. Monitoring is required to demonstrate that the condition of "no detectable emissions" has been met under some tank level 2 (264.1084(g)(1)(ii)) and container level 2 (264.1086(d)(ii)) controls. CAMDS may or may not use these control options, if so, annual monitoring will be conducted.

1) Closed Vent System and Control Device Monitoring (264.1033(k))

Monitoring of the closed vent systems (filter system duct work) at CAMDS is not generally required because these systems operate at negative pressure. One exception is the discharge sections of the guard bed filter, which operates at pressures equal to or greater than atmospheric and therefore requires monitoring.

The carbon filters are monitored continuously for agent breakthrough after the first two banks of carbon, as described in Attachment 18 of the RCRA part B permit. Vapors from agents, surrogates, and agent related decon solutions are the only organic compounds that could be present in the site ventilation and filter system. The breakthrough monitoring and carbon replacement requirements of 264.1033 (Subpart AA) are met or exceeded.

2) Container Monitoring

Monitoring for VOCs is required only for containers managed under one of the Level 2 alternatives as specified in section 6.7.2 above.

The monitoring for no detectable emissions of any container managed under Level 2 control, will verify that no VOC emissions are present in excess of 500 ppm above background levels.

3) Tank Monitoring

The headspaces above the liquids stored in the brine dryer area tanks operate at near atmospheric pressure or slightly above. Therefore, annual monitoring of the external tank roofs is required. The headspaces of the other tanks at CAMDS operate at pressures below atmospheric and therefore do not require annual monitoring for VOCs.

6A.9.1 Monitoring - Leak Check Requirements

Instrumentation for leak checking must comply with EPA Method 21 of 40 CFR part 60.

For containers, check each potential leak interface (any place where an organic vapor leak could occur) on the container, its cover, associated closure devices; cover rim, container wall, periphery of any opening or seam on the container. During any testing for leaks, the container covers and closures shall be in the closed, sealed position.

For duct systems, check each flange, gasket, pipe nipple, dampers and actuators, or any other connections from which organic vapors might escape.

For tank systems, check all closure devices, vacuum / pressure relief devices, instrument or piping interfaces of the vapor space above the tank liquid level. Monitoring is only required when the tank vapor space is at or above atmospheric pressure.

6A.9.2 Monitoring Frequency

Monitoring for operating with no detectable emissions (no emission readings > 500 ppmv above background, in accordance with EPA Method 21) will normally be conducted at least annually. Monitoring of tank roofs or covers can be performed at intervals greater than annually whenever such monitoring would expose workers to unsafe conditions.

6A.10 INSPECTION AND MONITORING REQUIREMENTS

All monitoring for VOC leaks must comply with EPA Method 21, and the requirements of 264.1034. These requirements include:

- i. monitoring must comply with Reference Method 21 in 40 CFR part 60.
- ii. the instrument must meet the performance requirements of Method 21.
- iii. the instrument must be calibrated before use on each day of its use by the procedures given in Method 21, including the specified calibration gases.
- iv. the instrument probe must traverse around all potential leak interfaces as close to the interface as possible (as described in Method 21).

Tank inspections:

For tanks whose head space is maintained at a pressure below atmospheric: (Agent storage tanks, and TMF tanks) initial visual inspections are required on or before the date the tanks become subject to Subpart CC, and must be repeated at least once per calendar year thereafter, except for safety-related circumstances listed below. The tank roofs and closure devices must be visually inspected for defects (cracks, holes, gaps, broken or damaged seals or gaskets, broken or missing hatches, access covers, etc.) that could lead to air pollutant emissions.

For tanks whose head space is maintained at atmospheric pressure or above: Initial monitoring (EPA Method 21) is required on or before the date the tanks become subject to Subpart CC, and must be repeated at least once per calendar year thereafter, except for special circumstances listed below. The tank roofs and closure devices must be monitored for leaks (monitor joints, gaskets, equipment penetrations, etc.)

If the annual inspections and monitoring expose the worker to dangerous, hazardous, or unsafe conditions, the alternative requirements of 264.1084(l)(i) - (ii) may be complied with:

- i. prepare a written explanation for why the tank roof are unsafe to visually inspect or to monitor, if required.
- ii. develop and implement a written plan and schedule to inspect and monitor the tank roof as frequently as practicable during those times when a worker can safely access the tank roof.

Container inspections:

When containers of HW (subject to Subpart CC) are first generated at CAMDS, a visual inspection of each container must be performed within 24 hours of placing HW in the container. Visually inspect the container and cover for cracks, holes, gaps, or other open spaces.

For any containers, subject to Subpart CC, that remain on site for more than one year, visual inspections are required within one year, and annually thereafter, of the date of the original inspection when the container was first filled.

Closed Vent System Inspections:

- 1) Closed Vent Systems operating at a pressure equal to or greater than atmospheric, must be designed and operated for no detectable organic emissions. Having no detectable organic emissions is demonstrated by leak detection Monitoring via EPA Method 21, and finding no VOC readings greater than 500 ppmv above background levels. At CAMDS, only the duct section leaving the guard bed filter is operated at pressures equal to or above atmospheric. The Guard Bed filter exit duct must be monitored initially and at least once per year (for the condition of no detectable organic emissions) thereafter. All seams, joints, and interfaces in the duct system must be monitored.
- 2) Closed Vent Systems that operate at a pressure less than ambient (264.1033(k)(2)) must undergo visual inspections for defects (cracks, holes, gaps, loose connections, etc.) that could result in emissions of pollutants to the atmosphere initially, and at least one per calendar year thereafter.

Control Device Inspections:

As required by 264.1087(c)(7), the carbon filter control device must be inspected in accordance with 264.1033(f)(2) by monitoring the levels of organic compounds (agents) on a regular schedule and replacing the existing carbon with fresh carbon immediately when breakthrough is indicated. CAMDS complies with this requirement by the method given in Attachment #18, sections 18.3 and 18.4. When agent breakthrough is detected by Near Real Time (NRT) monitors, the carbon filter is taken out of service and the contaminated carbon banks are changed out.

6A.11 MAINTENANCE OF TANKS, CONTAINERS, CLOSED VENT SYSTEMS

For any defects noted from tank inspections, the first attempt at repair must be made within 5 calendar days of detection. The repairs will be completed as soon as possible, but not longer than 45 calendar days. Repairs may be delayed beyond the 45-day period if any of the following circumstances apply:

- 1) If repair requires emptying the tank, and no alternative tank capacity is available. In this case the tank will be repaired as soon as the process that produces the waste ceases operation. Repair will be completed before the process resumes operation.
- 2) When a defect is discovered in the container, cover, or closure device, the first attempt at repair must occur within 24 hours of the discovery. The repair should be made as soon as possible, but not longer than 5 calendar days. If a repair cannot be completed within the five-day limit, the waste will be transferred to another container that does meet the Subpart CC requirements.
- 3) In the event sections of the closed vent system (that operates at a pressure equal to or greater than atmospheric pressure) are found to have a detectable level of emissions (> 500 ppmv). The equipment will be brought back into compliance no later than 15

calendar days after the emissions were detected. The first attempt at repair will be made no later than 5 days after the emissions are detected.

For containers subject to Subpart CC, defects must be repaired no later than 5 days from when discovered with the first attempt at repair to be conducted no later than 24 hours from the initial discovery.

6A.12 RECORD KEEPING REQUIREMENTS

All records that are required under Subpart CC must be maintained for at least three years, except for air emission control equipment, which must be maintained in the operating records until this equipment is replaced or is otherwise no longer in service.

1) Tank Record Keeping

Subpart CC requires identification numbers for each tank. Records must be kept of all inspections including the dates conducted. Records must also be kept documenting the location, description, and corrective actions (repairs) completed and the dates of the repairs, if any.

The record keeping requirements of Subpart CC are also required by the facility-operating permit.

At CAMDS, for any tanks that comply with tank level 1 controls (ie. agent storage tanks, TMF tanks, BDA tanks) records must be maintained of the latest determination of the maximum organic vapor pressure.

Tanks inside enclosures require records of the most recent set of calculations and measurements performed to verify that the enclosure meets the criteria of a permanent total enclosure as specified in Procedure T. Currently, there are several buildings that contain the agent storage tanks, and are considered enclosures. These buildings include: the Projectile Line System (PLS)/ Multipurpose Demilitarization Facility (MDF), the Rocket Line System (RLD), the Toxic Maintenance Facility (TMF), and the Liquid Incinerator (LIC).

For any tank or container that contains HW that is exempted from Subpart CC controls, waste determinations (that show the HW has < 500 ppmw VOCs) must be documented, updated each year or more frequently if the process changes, and maintained in the operating record.

2) Container Record Keeping

When containers are managed with Level 1 controls, there are no record keeping requirements.

At CAMDS all containers, except SPORTs, meet the DOT packaging requirements, and thus comply with container level 1 and level 2 control requirements. SPORTs comply with container level 1 controls when only wastes without free liquids are stored.

3) Closed Vent System and Control Device Record Keeping

A certification, signed and dated by the owner / operator of CAMDS, that states that the control devices are designed to operate at the performance level documented by a design analysis as specified in 40 CFR 264.1035 (b)(4) [Subpart AA], or by performance testing as specified in 40 CFR 264.1035(b)(3), also part of Subpart AA will be maintained in the facility operating record.

A design analysis was completed (see appendix), and a copy is maintained at CAMDS.

No additional record keeping, above the requirements of the RCRA operating permit, is required for the control equipment (carbon filter system).

Descriptions and dates of any modifications to the filter system will be maintained in the operating record.

Instances of any carbon filters that were operated and did not meet the removal efficiency of 95% by weight will be maintained in the operating record.

Subpart CC requires records of inspections and the design of the closed vent systems and control devices. Since these requirements are also required under the facility-operating permit, no further record keeping is required under Subpart CC.

Records for management of spent activated carbon are required to be maintained, in accordance with 40 CFR 264.1033 (n). This includes descriptions of modifications to the closed vent system, dates and times of monitoring for breakthrough (including the readings obtained), and the dates when existing carbon is replaced.

6A.12 REPORTING REQUIREMENTS

For each tank that is subject to Subpart CC in section 6.7.1 above, a written report will be submitted to the Executive Secretary within 15 days of each occurrence when hazardous waste is placed in these tanks in non-compliance with the appropriate Subpart CC tank controls. This report will contain the facility EPA ID no., the facility name and address, a description of the non-compliance event and the cause, the dates of non-compliance, and the actions taken to correct the non-compliance and to prevent recurrence of the non-compliance in the future.

Such occurrences may include placing HW with >500 ppmw volatile organics in a tank or container that does not comply with the appropriate Subpart CC controls, placing waste with a maximum organic vapor pressure greater than that allowed by tank level 1 criteria (264.1084(b)).

Any instances, in which the carbon filters operate such that the 95% removal efficiency standard is not met for a two hour period or greater, must be included in a semi-annual report written to the Regional Administrator.

6A.13 SUBPART CC REQUIREMENTS FOR SPECIAL PROGRAMS AT CAMDS

Programs to demonstrate / develop alternative treatments of chemical agent munitions are part of the ongoing work schedule at CAMDS.

Depending on the hazardous waste status of the testing programs, scheduling and quantities of wastes treated, various permitting options will be exercised (ie. treatability studies, RD&D permits, or modifications to the facility operating permits) as required to allow the work to go forward.

Regardless of the type of permitting, each proposed project will be evaluated for requirements for Subpart CC compliance, as well as the other compliance requirements at CAMDS. The specific Subpart CC details of each project will be included in the permitting documentation, and will be

reviewed on a case-by-case basis by the Utah DSHW.

VX Water Neutralization Program

In this program VX agent, containing greater than 500 ppmw of VOCs, is treated in a specially designed instrumented ton container (ITC) and thus must comply with the Subpart CC requirements for container level 3 controls. The level 3 control option that CAMDS will use is a container vented inside an enclosure exhausted through a closed vent system to a control device. The enclosure is the BIF agent drain bay room. This room is designed and will be operated in accordance with the criteria for a permanent total enclosure. This criteria will be verified by performing the Procedure "T" verification. The control device is the site HVAC filter system.

The transfer of VX agent in and out of the ITC will be conducted in such a manner to minimize the exposure to the atmosphere.

All of the applicable inspection, monitoring, and record keeping requirements for closed vent systems and control devices will be met.

ATTACHMENT #6A
APPENDIX 1
CONTROL DEVICE PERFORMANCE ANALYSIS
AND CERTIFICATION

ATTACHMENT #6A
APPENDIX 2
SUBPART CC SAMPLING AND ANALYSIS PLAN

SUBPART CC SITE SAMPLING AND ANALYSIS PLAN

This plan describes the methods (equipment and procedures) that will be used at CAMDS to meet the analytical requirements of the Subpart CC regulations. Waste determination procedures employing both direct measurement and owner or operator knowledge are included in this plan.

For CAMDS, these waste determination requirements fall into three general areas:

1. The determination of volatile organic content for wastes which CAMDS intends to exempt from Subpart CC VOC controls. Note: this may also be used for wastes that CAMDS could choose to treat to reduce the VOC content by 95% and thereby avoid Subpart CC VOC controls. CAMDS does not treat HW to avoid Subpart CC control requirements, therefore these sampling and analytical procedures are not included in this plan.
2. The determination of maximum organic vapor pressure for hazardous wastes stored in tanks under tank level 1 controls. The Subpart CC regulations limit the maximum vapor pressure of the bulk liquids stored in tanks under level 1 controls. The maximum allowable pressure depends on the volume of the tank.
3. Leak detection monitoring. Subpart CC requires annual testing for the condition of “no detectable organic emissions” for sections of closed vent systems and closure devices on tank headspaces that operate at atmospheric pressure or above.

1. Determination of Average Volatile Organic (VO) Concentration 265.1084(a)

Managed in tanks or containers without Subpart CC VOC Controls. The following sampling and analytical procedures are only required for hazardous waste streams that are.

The action level of VOCs that triggers the Subpart CC requirements is 500 ppmw of volatile organics. The purpose for determining the average VO concentration is to exempt a waste stream from the Subpart CC control measures. The general approach used at CAMDS is to comply with the required level of Subpart CC controls for all HW that is stored or treated in tanks and containers. Therefore, the determination of VOC concentration will not normally be required. CAMDS performs testing of equipment and processes that could involve managing HW in tanks and containers. Although CAMDS normally will try to comply with the Subpart CC controls, there could be occasions where it would be preferable to exempt a waste stream or process, and this would require a waste determination for VOC concentration.

The Subpart CC regulations allow either direct measurement (collecting samples and analysis for average VOC concentration) or Owner or Operator Knowledge to be used for VO concentration waste determinations. CAMDS will use either method depending on the availability of information about the waste composition. Waste determinations by direct measurement shall comply with the requirements for sampling and analysis of Attachments 2 and 3 of the RCRA permit.

Operator knowledge will be based upon previous direct measurements, or material balances, or from previous data that are applicable to the current waste stream, or documentation included in shipping papers, manifests, or certification notices.

1.1 Waste Determination by Direct Measurement

Procedures:

1. Determine an averaging period in which there is no change in the waste VO composition that could cause the VOC levels to exceed the action limit of 500 ppmw VO concentration. The averaging period cannot exceed one year (ie. at least one set of sampling and analysis is required each year). Each time the process changes such that the expected waste VO concentration could change enough to exceed the action limit, a new averaging period is required. Record the averaging period.
2. Identify the waste and record the point of waste origination. At CAMDS, the point of waste origination is the location of the waste at the point where the material is determined to be a hazardous waste.
3. Samples will be collected in a manner consistent with the requirements of Method 8260B of SW 846.
 - a) Collect at least 4 samples of the waste stream. All of the samples for a given waste stream must be sampled within a 1-hour period.
 - b) To ensure the samples are representative, agitate the contents of a tank for at least 1 hour before sampling, or use the appropriate method (ie. SW846) for sampling containers or tanks of unmixed or stratified material.
 - c) Use sampling containers that are impervious to organics such that organics will not be adsorbed from the sample, or introduced into the sample. 40 ml VOA vials with Teflon septa are required. Zero headspace sampling is required.
 - d) Preserve the samples with hydrochloric acid solution and at 4 deg. C. Make sure the maximum holding time of 14 days is not exceeded.

Normally, the analytical laboratory supplies the correct size and type of sample containers, and required preservatives.

4. Analyze samples for VO concentration by EPA Method 8260.
5. Calculate the average VO concentration by averaging the four or more sample results.
6. Collect QA/QC samples as required by SW846 and Attachment 2 of the RCRA permit.

1.2 Waste Determination by Owner or Operator Knowledge

Prepare a written documentation package to be placed in the operating record that explains the basis for how the owner or operator knowledge of the average waste stream VOC concentration was determined.

At CAMDS the following are typical methods of applying owner / operator knowledge to determine the VOC content of wastes:

- 1.2.1. Use of Material Balances if the composition of all compounds going into a process are known to not contain any volatile organics (ie. by material labeling, specifications, etc.), or if the precise quantity of organic material is known then the average VOC level can be estimated by this use of

knowledge.

- 1.2.2. Use of Chemical Test Results- if analytical test data are available for other projects or operations at CAMDS in which the conditions that determine VOC content are applicable, that data (VO concentration) would be used to determine the VOC levels.
- 1.2.3. Use of Data from Other Locations- If VOC data are available from other locations outside of CAMDS in which the conditions of the operations at CAMDS are comparable (as related to VOC content), this data can be used as a determination of the VOC levels.
- 1.2.4. Information provided about waste constituents such as shipping manifests, shipping documents, and waste certifications.

2. Determination of Maximum Organic Vapor Pressure

The hazardous waste tanks at CAMDS all comply with Subpart CC's Tank Level 1 controls. These tanks, their locations, and volumes are given in the table below.

<p style="text-align: center;">Table 1.0 CAMDS Tanks, Allowable Maximum Organic Vapor Pressures</p>				
Tank No.	Volume (gallons / meters³)	Location	Material Managed	Max Allowable VOC Pressure
SEG-T1	250 / 0.946	ECC Seg. Bldg.	Agent	11.11 psi
SEG-T2	250 / 0.946	ECC Seg. Bldg.	Agent	11.11 psi
MDF-T3	250 / 0.946	Munition Demil Facility	Agent	11.11 psi
MDF-T4	250 / 0.946	Munition Demil Facility	Agent	11.11 psi
LIC-T5	250 / 0.946	LIC Bldg.	Agent	11.11 psi
ASR-T6	250 / 0.946	Agent Storage Room	Agent	11.11 psi
ASR-T7	450 / 1.703	Agent Storage Room	Agent	11.11 psi
TMF-1	1,400 / 5.3	TMF Bldg.	SDS, Misc. waste liquids, liq. lab wastes	11.11 psi
TMF-2	1,400 / 5.3	TMF Bldg.	SDS, Misc. waste liquids, liq. lab wastes	11.11 psi
T13-A	4,500 / 17.03	BDA Bldg.	Spent PAS Brines	11.11 psi
T13-B	4,500 / 17.03	BDA Bldg.	Spent PAS Brines	11.11 psi
T13-C	4,500 / 17.03	BDA Bldg.	Spent PAS Brines	11.11 psi
T13-D	13,500 / 51.1	BDA Bldg.	Spent PAS Brine or SDS	11.11 psi
T13-E	13,500 / 51.1	BDA Bldg.	Spent PAS Brine or SDS	11.11 psi

For tanks subject to level 1 controls with volumes less than 20,000 gallons, Subpart CC allows a maximum organic vapor pressure of 11.11 psi.

The two general approaches allowed by Subpart CC to determine the maximum organic vapor pressure of hazardous waste in a tank using tank level 1 controls are direct measurement and knowledge of the waste.

It should be noted that few organic liquids (ie. diethyl ether, freon, etc.) would have a vapor pressure that exceeds 11.1 psi at the maximum temperature expected for CAMDS' tanks, which is 107 °F. The major component of wastes (PAS brine and SDS) stored in tanks outside of ventilation control at CAMDS' tanks is water, which has a vapor pressure of 0.95 psia at 100 °F. Even if the tanks contained pure acetone, a highly volatile organic liquid, at 103 °F., the vapor pressure would only be 7.7 psi.

The only organic containing wastes at CAMDS that are expected to be present in appreciable quantities are the chemical agents. The vapor pressures at 25 deg °C are given in the Table 2. below:

Table 2.0 Vapor Pressure of Chemical Agents at 25°C.	
Chemical Agent	Vapor Pressure (psi)
GB	0.057
GA	0.001
VX	1.191×10^{-5}
H, HD	0.002
MCB (a diluent of agent GA)	0.193 (@ 22.2 °C.)

The temperatures at which the organic vapor pressures are given in Table 2.0 are closer to the average temperature than the worst case expected temperature of 107 °F (41.7 °C.). The vapor pressures of the agents will be higher at the worst-case temperature, but will be far below the maximum allowable vapor pressure of 11.1 psi.

2.1 Maximum Organic Vapor Pressure Determination by Direct Measurement (265.1084(c)(3))

In general, CAMDS will avoid using direct measurement to determine the maximum organic vapor pressure of wastes stored in tanks. The reason for avoiding direct measurement is that the allowable methods are either unavailable (no labs could be found that perform or have knowledge of the methods), as in the case with Method 25E and ASTM Method 2879-92, or because they don't apply to the types of tanks at CAMDS (API Pub. 2517, which applies to floating roof tanks).

If a direct measurement method is used, CAMDS will use a method, which consists of adding a sample to a closed container in a heated water bath, and using a thermometer and a manometer to measure pressure, determine the maximum total pressure at the worst-case temperature of 107 °F. This method could be included in the categories of "Any other method approved by the Regional Administrator (265.1084(c)(3)(ii)(E)), or "Methods from standard reference texts (265.1084(c)(3)(ii)(C))."

Collection of samples for sampling from an agitated tank, one sample will be collected after agitating the tank contents for a minimum of one hour. For sampling from sources that are not well mixed, a minimum of three samples will be collected. The samples will be collected in glass or plastic bottles, with tightly fitting lids. Avoid agitating the samples while filling containers. The samples will be analyzed as described above within one day after being collected.

Sampling and analysis will be repeated whenever there is a change in the process that could reasonably be expected to increase the maximum organic vapor pressure above the allowable limit of 11.1 psi. There is no requirement for annual resampling, provided the process does not change in such a manner to increase the maximum organic vapor pressure above the limit of 11.1 psi.

2.2 Maximum Organic Vapor Pressure Determination by Knowledge of the Waste (265.1084(c)(4))

CAMDS will use knowledge of the composition of the wastes to estimate the maximum organic vapor pressure of wastes stored in tanks. The maximum organic vapor pressure is expected at the highest temperature of 107 °F.

Estimates of organic vapor pressure will take into account the concentration of the organic compounds as determined by previous Method 8260 analyses, typically in the ppb / ppm range, the solubility in water, and will consider the application of Raoult's Law¹ as an approximation. Since the organics are only present in trace quantities, it is expected that the maximum total vapor pressure present would be approximately that of water.

CAMDS already has a requirement in the RCRA permit (Waste Analysis Plan, Attachment 2) to sample waste streams going into the tanks using Method 8260 at least annually or when ever process changes occur that could result in an increase in organic content. This data will be used to estimate the maximum expected organic vapor pressure. No additional sampling and analysis will be required.

3. Leak Detection Monitoring (265.1084(d))

Subpart CC requires the verification of operating with “no detectable organic emissions” as defined as a no readings of greater than 500 ppmv of organics above background levels, and as measured in accordance with EPA Method 21. At CAMDS, this verification is required on tank headspace equipment interfaces (ie gaskets, seals, hatch covers, etc.), where the tank headspace is at atmospheric pressure or greater. This condition only applies to the five BDA tanks located in the Brine Dryer Area building. The headspaces of the other tanks are operated at below atmospheric pressure.

3.1 Monitoring Instrument

The monitoring instrument used at CAMDS is a MiniRAE portable VOC monitor. This instrument is designed for VOC leak detection, via EPA Method 21, utilizing a photo ionization detector (PID). The table below lists the requirements of Method 21 and how this instrument meets the requirements.

¹ Raoult's Law: the vapor pressure of a substance in equilibrium with a solution of the substance is equal to the mole fraction of the substance multiplied by the vapor pressure of the pure substance.

Method 21 Specification	MiniRAE 2000 Parameter
Detects VOC compounds	Responds to a broad range of organic compounds
Linear Response Range	0 – 2000 ppm
Instrument Scale (resolution)	1 ppmv (1000 – 10,000 ppm)
Sample Flow Rate	0.4 – 0.6 L/min.
Intrinsic Safety	Class 1, Division 1
Probe Dimension	3/16 in.
Response Factor Value	<10 for most compounds, using isobutylene calibration gas
Response Time	#2 seconds to 90% of final value
Calibration Precision	∓ 2% of Calibration gas value
Response Factor Availability	Available for > 100 compounds
Calibration Precision Test	Daily Calibration
Calibration Gas Certification	∓ 2%

The linear operating range of the instrument encompasses the target leak concentration of 500 ppm. The Subpart CC definition of “no detectable organic emissions” is defined as VO concentration readings less than 500 ppmv above the background level.

3.2 Leak Detection Procedure

- 3.2.1 Zero and calibrate the instrument using calibration gas (isobutylene, approximately 500 ppm in zero air balance) and zero air.
- 3.2.2 Determine the local background level of VO concentration around the point being tested by moving the probe inlet randomly around the point at a distance of at least 25 centimeters (0.82 ft), but preferably 1 - 2 meters (3-6 ft.).
- 3.2.3 Conduct the “no detectable organic emissions” survey by placing the probe inlet at the surface of the component where leakage could occur. For tank headspaces check around conservation vents, man way gaskets, agitator shaft gaskets, rupture disk gaskets, or any other areas of where the tank roof is penetrated.

Move the probe along the periphery of the interface, gasket, etc. while observing the instrument readout.

If an increased reading is obtained, continue sampling at that location to obtain a maximum instrument reading. Continue sampling at this location for at least 2 times the instrument response time. Record and report readings that exceed 500 ppm above the background level. Record and report to the CAMDS Environmental Branch Chief any readings that exceed the leak threshold. Prompt reporting to the Environmental Branch Chief is required to complete the repairs within 15 days, with the first attempt at repair to begin within 5 days (as required by Subpart CC regulations).

Leak detection monitoring must be conducted at least once each calendar year. Any leaks found must be repaired as required by section 6.11 (Maintenance of Tanks, Containers, Closed Vent Systems) of the Subpart CC Compliance Plan.

3.3 Instrument Evaluation Procedures

Before performing Method 21 testing, allow the instrument to warm up as required by the manufacturer's recommendations.

3.3.1 Determine the Response Factor:

- Calibrate the instrument as specified by the manufacturer.
- Obtain a known sample of the organic species to be measured (isobutylene) at a concentration of about 80 percent of the applicable leak definition, which for CAMDS is about 400 ppm.
- Make a total of three measurements of the sample, alternating with air (background levels) between each reading. Calculate the average measurement and calculate the response factor by dividing the known concentration by the average of the three measurements. The response factor must be less than 10. The response factor test only is required at the time an instrument is put into service; it does not have to be repeated periodically.

3.4.2 Determine the Instrument Response Time

- Introduce zero gas (or background air) into the instrument probe.
- When the zero gas reading stabilizes, switch the probe to sample the calibration gas.
- Measure the time required for the instrument to reach 90 percent of the final stable reading.
- Perform this test three times, record the results and calculate the average response time.

Note: this test is only required to be done at the time the instrument is put into service, provided that the instrument is not modified in such a way as to have an effect on the response time.

3.4.3 Calibration Precision Testing

- Make a total of three measurements by alternately using zero gas (or background air) and the calibration gas, record the readings.
- Calculate the algebraic difference between the readings and the known value. Divide this average difference by the known calibration value and multiply by 100 to express the resulting calibration precision as a percentage.
- The calibration precision must be equal to or less than 10 percent of the calibration gas value.
- The calibration precision procedure must be complete before placing the instrument in service and at 3-month intervals thereafter, or at the next usage, whichever is later.

4.0 Quality Assurance / Quality Control

All applicable QA/QC provisions of Attachment #2 of the RCRA Permit (Waste Analysis Plan) are incorporated into this sampling and analysis plan.